

The Prime Hook NWR Water Monitoring System has been converted from EcoNet to a new online platform called Storm Central. Although this system is more powerful for data management and analysis, it will look and function differently to our public users. This page contains tips and explanations that will help.

Water Monitoring Website: <https://stormcentral.waterlog.com/public/USFWS>

Monitoring Site Locations

The locations of real-time monitoring have changed somewhat with the upgraded system. Water Level, Salinity, Temperature, and now Dissolved Oxygen, are monitored in three locations on the refuge, from north to south:

- 1) Slaughter Beach Road, under the Slaughter Canal Bridge (this is a new location)
- 2) Prime Hook Road, in the southern end of Unit II, on the north side of the road
- 3) Petersfield Ditch, in the southern end of Unit III, on the north side of Broadkill Beach Rd.

Water Level Alert System

The monitoring locations are depicted by water drops on the map.



From north to south, they are 1) Slaughter Beach Road, 2) Prime Hook Road, and 3) Petersfield Ditch

When the water drop icons are **BLUE**, there are no high water level concerns. In the previous system, the default color was Green. When water levels rise during spring tide or storms, the icons will change color to **YELLOW**, and then to **RED**, in a manner similar to the previous system. This information does not replace official road condition and closure information from DelDOT, formal weather forecasts, and individual responsibility and judgment regarding driving conditions.

STORM CENTRAL Log in

Prime Hook National Wildlife Refuge Marsh & Water Monitoring Network WATERLOG a xylem brand

NETWORKS

Public Networks Map

- Default Network
 - Petersfield Ditch
 - Prime Hook Road
 - Slaughter Canal Bridge
- USFWS Prime Hook
 - Petersfield Ditch
 - Prime Hook Road
 - Slaughter Canal Bridge

Map showing monitoring locations (blue water drops) on the Prime Hook National Wildlife Refuge. Locations include Slaughter Beach, Prime Hook Road, and Petersfield Ditch. The map also shows surrounding areas like Harrington, Houston, Milford, Greenwood, Ellendale, Milton, Lewes, Rehoboth Beach, and Cape Henlopen State Park. Major roads like 13, 113, 16, and 9 are visible.

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Water Monitoring Parameters Being Measured

The following water monitoring parameters are measured at each location.

Temperature = Water temperature, in degrees Celcius (As a reference, 0°C = 32°F; 18°C = 65°F)

Specific Conductivity = How well water conducts electricity; an alternate way to measure salinity and water quality

Salinity = Saltiness of the water, measured in parts per thousand (ppt)

Water Level = Elevation of the water level relative to the North American Vertical Datum 1988 (NAVD88); Note that this does not represent “depth of water above the ground” and it is helpful to understand the elevation of the roads dividing the units; We will work to provide that information on the website eventually.

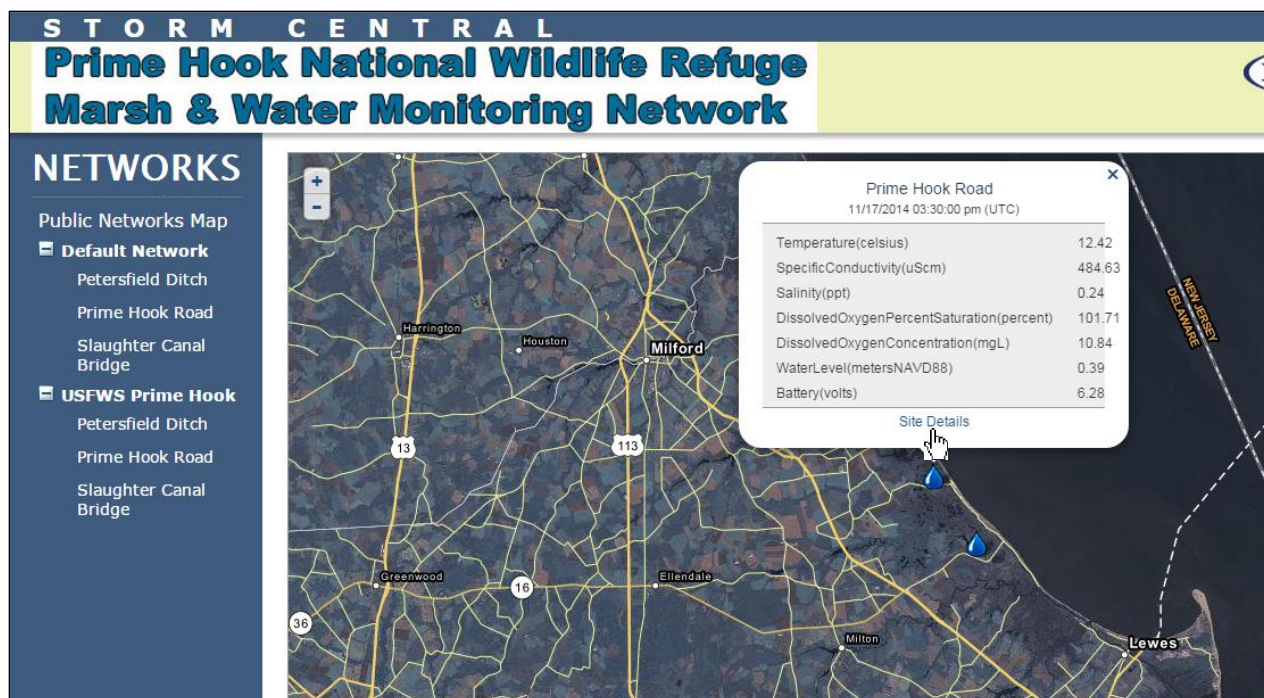
Dissolved Oxygen = Amount of oxygen present in the water; It is measured two ways – Concentration (mg/L) and Percent Saturation. By default, we display the Concentration. To learn more about this parameter, visit <http://www.waterontheweb.org/under/waterquality/oxygen.html>

Battery = This is an internal measurement of the hardware’s battery. It is measured by default and is of no use for the public.

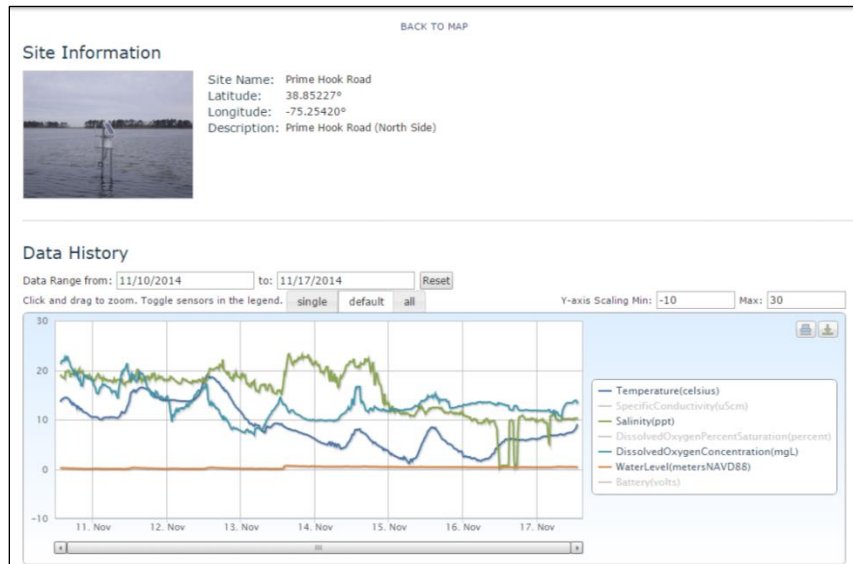
Viewing Water Level and Salinity Values

The new system does not have the same simple graphics that the previous system had to display current conditions. This will be the biggest adjustment for public users. The data is displayed on an interactive graph. The following tips will help you navigate the graph to view the data of interest to you.

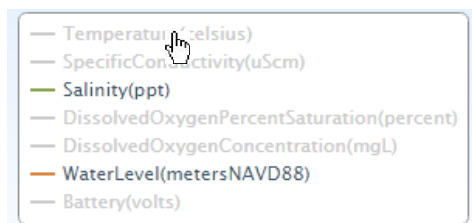
- 1) Click on the water drop icon to see the most recent data available at that location
- 2) Then click on Site Details to see more recent data for the site



- 3) By default, Temperature, Salinity, Water Level, and Dissolved Oxygen Concentration are displayed on the interactive graph, for the most recent week. The other parameters are grayed out in the legend and do not appear in the graph. Because they all have very different values, the data range on the left results in Water Level, for example, looking very “flat” in the initial graph. This is easy to change as you explore the data.



- 4) Parameters can be “turned off” on the graph by clicking the parameter name in the legend. When a parameter is “off” the name is grayed out. The remaining “active” parameters will be displayed. This will automatically adjust the range on the graph, making it easier to see the patterns in recent changes. To turn a parameter back “on” click the grayed-out parameter name in the legend.

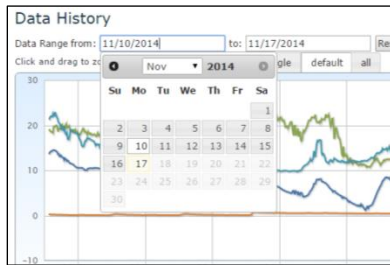


For example, to see only the recent fluctuation in Water Level, click on Temperature, Salinity, and Dissolved Oxygen Concentration to turn those parameters off. Only Water Level will still be visible, and the graph range will adjust automatically.

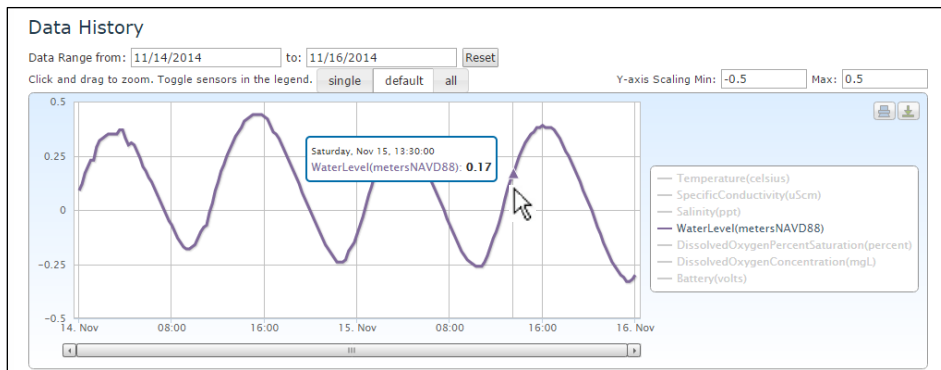
To next see only the recent fluctuation in Salinity, click on Salinity to turn it back on and click on Water Level to turn it off. Now, only Salinity will be visible, and the graph range will adjust automatically.

To look at the other parameters, toggle them on and off by clicking the parameter names.

- 5) The Date Range that automatically displays is the most recent week (7 days). To change the date range, click in the “from:” or “to:” box and a calendar will pop up. Choose the start and end dates of interest. When looking at data for just 2-4 days at a time, the time range at the bottom of the graph will adjust, so you can see the changes over hours rather than days. *[Note that data collection began in late October, but the first few weeks may contain data errors as the equipment was calibrated and adjusted.]*



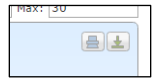
- 6) To see the data recorded for a particular time along the line of the graph, use the mouse to place the cursor over that date/time in the range. A box will pop up showing the reading of all parameters that are “active” in the legend. Move the cursor right and left to see how the readings change over time.



- 7) An easy way to look at data for just a portion of the time displayed on the graph is to click, hold, and drag across a portion of the line, which will highlight in blue. The graph will zoom into the selected timeframe.



8) Icons in the upper right hand corner of the chart will enable the user to Print or Save the graph image.



9) A table of the data is provided below the graph. By adjusting the dates in the graph, the table will display the chosen Start Date, through the most current data (the End Date of table data cannot be adjusted). The public is not able to download raw tabular data from the website. This is because the data goes through a quality control step, where any outlier readings noticed are checked and removed from the overall data set if necessary. Often outlier data occurs during times that equipment is being swapped or maintained, or if the equipment is encountering any problems. Outlier data can be misleading and can skew data analysis.

Date	Time	Temperature(celsius)	SpecificConductivity(uScm)	Salinity(ppt)	DissolvedOxygenPercentSaturation(percent)	Dissolve
11/17/2014	14:15:00	9.48	17629.93	10.40	102.05	
11/17/2014	14:00:00	10.00	17545.81	10.35	107.00	
11/17/2014	13:45:00	9.66	17024.56	10.01	120.47	
11/17/2014	13:30:00	9.11	17933.65	10.59	123.32	
11/17/2014	13:15:00	8.96	17606.15	10.37	126.13	
11/17/2014	13:00:00	8.95	17508.79	10.31	124.05	
11/17/2014	12:45:00	8.43	17523.99	10.31	126.13	
11/17/2014	12:30:00	8.15	17543.85	10.32	126.18	
11/17/2014	12:15:00	8.00	17467.89	10.27	124.49	
11/17/2014	12:00:00	7.79	17115.53	10.04	123.65	
11/17/2014	11:45:00	7.64	17427.29	10.23	121.73	
11/17/2014	11:30:00	7.52	17241.66	10.11	119.46	
11/17/2014	11:15:00	7.43	17163.37	10.06	118.92	
11/17/2014	11:00:00	7.44	17345.33	10.18	119.31	
11/17/2014	10:45:00	7.41	17215.13	10.09	119.46	

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